CLAIMS

What is claimed is:

1. An apparatus comprising:

a sensor unit to capture wavelength intensity data for a plurality of pixel locations wherein the sensor generates a value corresponding to an intensity of light from a selected range of wavelengths for the pixel locations and further wherein infrared intensity values are generated for a subset of the pixel locations; and

an interpolation unit coupled with the sensor unit to interpolate intensity data to estimate intensity values not generated by the sensor.

2. The apparatus of claim 1 wherein the red, green, blue and infrared intensity information are captured substantially contemporaneously.

3. The apparatus of claim 1 further comprising:

a red pixel buffer coupled with the interpolation unit to store red intensity data;

a green pixel buffer coupled with the interpolation unit to store green intensity data;

a blue pixel buffer coupled with the interpolation unit to store blue intensity data; and

an infrared pixel buffer coupled with the interpolation unit to store infrared intensity data.

4. The apparatus of claim 3 further comprising a signal processing unit coupled to the red pixel data buffer, the green pixel data buffer, the blue pixel data buffer and the infrared pixel data buffer.

5. The apparatus of claim 1 wherein the sensor unit captures intensity data according to a predetermined pattern comprising:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

6. The apparatus of claim 5, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n-1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

7. The apparatus of claim 5, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n) + X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m,n-1) + X(m,n+1)}{2}.$$

8. The apparatus of claim 5, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = (m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1) + X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n) + X(m+1,n)}{2}.$$

9. The apparatus of claim 5, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by

$IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$.

10. The apparatus of claim 1 wherein the sensor unit captures intensity data according to a predetermined pattern comprising:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

11. The apparatus of claim 10, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by

$G = \frac{X(m-1,n) + X(m+1,n)}{2}$, and further wherein if the pixel at location (m,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m,n+1)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n-1)$, and if the pixel at location (m,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m,n+1)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n-1)$.

12. The apparatus of claim 10, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n) + X(m,n-1) + X(m,n+1)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$ and further wherein if the pixel at location (m,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, and if the pixel at location (m,n) is blue, the red intensity corresponding to the location (m,n) is given by $B = X(m,n)$ and the blue intensity corresponding to the location (m,n) is given by $R = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$.

13. The apparatus of claim 10, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1) + X(m-1,n) + X(m+1,n)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = X(m,n)$ and further wherein if the pixel at location (m-1,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n+1) + X(m+1,n-1)}{2}$ and the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n+1)}{2}$, and if the pixel at location (m-1,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n+1) + (m+1,n-1)}{2}$ and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1) + X(m+1,n+1)}{2}$.

14. The apparatus of claim 10, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both even integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1) + X(m,n+1)}{2}$ and further wherein if the pixel at location (m-1,n) is red,

the blue intensity corresponding to the location (m,n) is given by $B = X(m+1,n)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, and if the pixel at location (m-1,n+1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m+1,n)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m-1,n)$.

15. The apparatus of claim 1 wherein the sensor unit captures intensity data according to a predetermined pattern comprising:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

16. The apparatus of claim 15, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by

$$IR = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green

intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n) + X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

17. The apparatus of claim 15, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1) + X(m,n+1)}{2}$.

18. The apparatus of claim 15, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m+1,n+1) + X(m+1,n-1)}{4}$, the green

intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

19. The apparatus of claim 15, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n+1)+X(m,n-1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n-1)+X(m+1,n+1)+X(m-1,n+1)+X(m+1,n-1)}{4}.$$

20. The apparatus of claim 1 wherein the sensor unit captures intensity data according to a predetermined pattern comprising:

B	G	B	B
IR	R	IR	R
B	G	B	G
IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

21. The apparatus of claim 20, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m-1,n+1) + X(m+1,n+1) + X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1) + X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

22. The apparatus of claim 20, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n) + X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1) + X(m,n+1)}{2}$.

23. The apparatus of claim 20, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

24. The apparatus of claim 20, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)+X(m+1,n-1)+X(m-1,n+1)}{4}$.

25. An apparatus comprising:

a complementary metal-oxide semiconductor (CMOS) sensor to capture an array of pixel data; and

a color filter array (CFA) to pass selected wavelength ranges to respective pixel locations of the CMOS sensor according to a predetermined pattern, wherein the wavelength ranges include at least infrared wavelengths for one or more pixel locations.

26. The apparatus of claim 25 wherein the predetermined pattern comprises:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

27. The apparatus of claim 26, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n-1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

28. The apparatus of claim 26, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m,n-1)+X(m,n+1)}{2}.$$

29. The apparatus of claim 26, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = (m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n)+X(m+1,n)}{2}.$$

30. The apparatus of claim 26, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$.

31. The apparatus of claim 25 wherein the predetermined pattern comprises:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

32. The apparatus of claim 31, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and further wherein if the pixel at location (m,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m,n+1)$ and the

red intensity corresponding to the location (m,n) is given by $R = X(m,n-1)$, and if the pixel at location (m,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m,n+1)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n-1)$.

33. The apparatus of claim 31, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n) + X(m,n-1) + X(m,n+1)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$ and further wherein if the pixel at location (m,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, and if the pixel at location (m,n) is blue, the red intensity corresponding to the location (m,n) is given by $B = X(m,n)$ and the blue intensity corresponding to the location (m,n) is given by $R = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$.

34. The apparatus of claim 31, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)+X(m-1,n)+X(m+1,n)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = X(m,n)$ and further wherein if the pixel at location (m-1,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n+1)+X(m+1,n-1)}{2}$ and the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m+1,n+1)}{2}$, and if the pixel at location (m-1,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n+1)+(m+1,n-1)}{2}$ and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)}{2}$.

35. The apparatus of claim 31, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both even integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$ and further wherein if the pixel at location (m-1,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m+1,n)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, and if the

pixel at location (m-1,n+1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m+1,n)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m-1,n)$.

36. The apparatus of claim 25 wherein the predetermined pattern comprises:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

37. The apparatus of claim 36, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

38. The apparatus of claim 36, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1)+X(m,n+1)}{2}$.

39. The apparatus of claim 36, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

40. The apparatus of claim 36, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by

$IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by

$R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n+1)+X(m,n-1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n-1)+X(m+1,n+1)+X(m-1,n+1)+X(m+1,n-1)}{4}.$$

41. The apparatus of claim 25 wherein the predetermined pattern comprises:

B	G	B	B
IR	R	IR	R
B	G	B	G
IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

42. The apparatus of claim 41, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by

$IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the green

intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1) + X(m,n+1)}{2}$,

and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

43. The apparatus of claim 41, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n) + X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1) + X(m,n+1)}{2}$.

44. The apparatus of claim 41, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, the green intensity corresponding to the location (m,n) is given by

$$G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

45. The apparatus of claim 41, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)+X(m+1,n-1)+X(m-1,n+1)}{4}$.

46. A method comprising:

receiving pixel data representing color intensity values for a plurality of pixel locations according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths;

generating intensity values for multiple color intensities corresponding to a single pixel location by interpolating intensity values corresponding to neighboring pixel locations;

promoting one or more of the generated intensity values to a user-accessible state.

47. The method of claim 46 wherein promoting the one or more of the generated intensity values to a user-accessible state comprises storing the received intensity values and the generated intensity values on a computer-readable storage device.

48. The method of claim 46 wherein promoting the one or more of the generated intensity values to a user-accessible state comprises:

generating an output image with the received intensity values and the generated intensity values; and

displaying the output image on a display device.

49. The method of claim 46 wherein promoting the one or more of the generated intensity values to a user-accessible state comprises:

generating an output image with the received intensity values and the generated intensity values; and

printing the output image.

50. The method of claim 46 wherein the predetermined pattern comprises:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

51. The method of claim 50, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1) + X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m-1,n+1) + X(m+1,n-1) + X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

52. The method of claim 50, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n) + X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m,n-1) + X(m,n+1)}{2}.$$

53. The method of claim 50, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = (m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

54. The method of claim 50, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$.

55. The method of claim 46 wherein the predetermined pattern comprises:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

56. The method of claim 55, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n) + X(m+1,n)}{2}$, and further wherein if the pixel at location (m,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m,n+1)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n-1)$, and if the pixel at location (m,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m,n+1)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n-1)$.

57. The method of claim 55, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by

$IR = \frac{X(m-1,n) + X(m+1,n) + X(m,n-1) + X(m,n+1)}{4}$ and green intensity corresponding to the location (m,n) is given by

$G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$ and further wherein if the pixel at location (m,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, and if the pixel at location (m,n) is blue, the red intensity corresponding to the location (m,n) is given by $B = X(m,n)$ and the blue intensity corresponding to the location (m,n) is given by

$R = \frac{X(m-2,n) + X(m+2,n) + X(m,n-2) + X(m,n+2)}{4}$.

58. The method of claim 55, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1) + X(m-1,n) + X(m+1,n)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = X(m,n)$ and further wherein if the pixel at location (m-1,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n+1) + X(m+1,n-1)}{2}$ and the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n+1)}{2}$, and if the pixel at location

(m-1,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n+1)+(m+1,n-1)}{2}$ and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)}{2}$.

59. The method of claim 55, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both even integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$ and further wherein if the pixel at location (m-1,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m+1,n)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, and if the pixel at location (m-1,n+1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m+1,n)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m-1,n)$.

60. The method of claim 46 wherein the predetermined pattern comprises:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

61. The method of claim 60, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

62. The method of claim 60, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1)+X(m,n+1)}{2}$.

63. The method of claim 60, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m+1,n+1) + X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n) + X(m+1,n)}{2}$.

64. The method of claim 60, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n) + X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n+1) + X(m,n-1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n-1) + X(m+1,n+1) + X(m-1,n+1) + X(m+1,n-1)}{4}.$$

65. The method of claim 46 wherein the predetermined pattern comprises:

B	G	B	B
IR	R	IR	R
B	G	B	G
IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

66. The method of claim 65, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n) + X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m-1,n+1) + X(m+1,n+1) + X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1) + X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

67. The method of claim 65, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n) + X(m+1,n)}{2}$, the green

intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1) + X(m,n+1)}{2}$.

68. The method of claim 65, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n) + X(m+1,n)}{2}$.

69. The method of claim 65, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by

$G=\frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B=\frac{X(m-1,n-1)+X(m+1,n+1)+X(m+1,n-1)+X(m-1,n+1)}{4}$.

70. A sensor that receives pixel data representing color intensity values for a plurality of pixel locations of a scene to be captured according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths.

71. The sensor of claim 70 wherein red intensity values, green intensity values, blue intensity values and infrared intensity values are capture substantially contemporaneously.

72. The apparatus of claim 70 wherein the predetermined pattern comprises:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

73. The apparatus of claim 70 wherein the predetermined pattern comprises:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

74. The apparatus of claim 70 wherein the predetermined pattern comprises:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

75. The apparatus of claim 70 wherein the predetermined pattern comprises:

B	G	B	B
IR	R	IR	R
B	G	B	G
IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

76. An apparatus comprising:

a lens system to focus a scene to be captured; and

a sensor to capture color data representing the scene passed by the lens system, the sensor to capture color intensity information according to a predetermined pixel pattern, wherein the color intensity information comprises at least infrared intensity information.

77. The apparatus of claim 76 wherein the predetermined pattern comprises:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

78. The apparatus of claim 76 wherein the predetermined pattern comprises:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

79. The apparatus of claim 76 wherein the predetermined pattern comprises:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

80. The apparatus of claim 76 wherein the predetermined pattern comprises:

B	G	B	B

IR	R	IR	R
B	G	B	G
IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

81. An article of manufacture comprising an electronically accessible medium having stored thereon instructions that, when executed, cause one or more processors to:

receive pixel data representing color intensity values for a plurality of pixel locations according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths;

generate intensity values for multiple color intensities corresponding to a single pixel location by interpolating intensity values corresponding to neighboring pixel locations;

promote one or more of the generated intensity values to a user-accessible state.

82. The article of claim 81 wherein the instructions that cause the one or more processors to promote the color intensity values to a user-accessible state comprise instructions that, when executed, cause the one or more processors to store the captured intensity values and the interpolated intensity values on a computer-readable storage device.

83. The article of claim 81 wherein the instructions that cause the one or more processors to promote the color intensity values to a user-accessible state comprise instructions that, when executed, cause the one or more processors to:

generate an output image with the received intensity values and the generated intensity values; and

display the output image on a display device.

84. The article of claim 81 wherein the instructions that cause the one or more processors to promote the color intensity values to a user-accessible state comprise instructions that, when executed, cause the one or more processors to:

generate an output image with the received intensity values and the generated intensity values; and

print the output image.

85. The article of claim 81 wherein the predetermined pattern comprises:

B	R	B	R
IR	G	IR	G
B	R	B	R
IR	G	IR	G

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

86. The article of claim 85, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd

integers, the infrared intensity corresponding to the location (m,n) is given by

$IR = \dfrac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \dfrac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \dfrac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n-1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

87. The article of claim 85, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by

$IR = \dfrac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \dfrac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$B = \dfrac{X(m,n-1)+X(m,n+1)}{2}$.

88. The article of claim 85, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given

by $IR = (m,n)$, the red intensity corresponding to the location (m,n) is given by

$R = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$B = \frac{X(m-1,n)+X(m+1,n)}{2}$.

89. The article of claim 85, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by

$IR = \frac{X(m,n-1)+X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$.

90. The article of claim 81 wherein the predetermined pattern comprises:

IR	R	IR	B
G	IR	G	IR
IR	B	IR	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

91. The article of claim 90, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and further wherein if the pixel at location (m,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m,n+1)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n-1)$, and if the pixel at location (m,n-1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m,n+1)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n-1)$.

92. The article of claim 90, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)+X(m,n-1)+X(m,n+1)}{4}$ and green intensity corresponding to the location (m,n) is given by

$G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$ and further wherein if the pixel at location (m,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-2,n)+X(m+2,n)+X(m,n-2)+X(m,n+2)}{4}$ and the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, and if the pixel at location (m,n) is blue, the red intensity corresponding to the location (m,n) is given by $B = X(m,n)$ and the blue intensity corresponding to the location (m,n) is given by $R = \frac{X(m-2,n)+X(m+2,n)+X(m,n-2)+X(m,n+2)}{4}$.

93. The article of claim 90, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1)+X(m,n+1)+X(m-1,n)+X(m+1,n)}{4}$ and green intensity corresponding to the location (m,n) is given by $G = X(m,n)$ and further wherein if the pixel at location (m-1,n-1) is red, the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n+1)+X(m+1,n-1)}{2}$ and the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m+1,n+1)}{2}$, and if the pixel at location (m-1,n-1) is blue, the red intensity corresponding to the location (m,n) is given by

$R = \frac{X(m-1,n+1)+(m+1,n-1)}{2}$ and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)}{2}$.

94. The article of claim 90, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both even integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, and the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$ and further wherein if the pixel at location (m-1,n) is red, the blue intensity corresponding to the location (m,n) is given by $B = X(m+1,n)$ and the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, and if the pixel at location (m-1,n+1) is blue, the red intensity corresponding to the location (m,n) is given by $R = X(m+1,n)$ and the blue intensity corresponding to the location (m,n) is given by $B = X(m-1,n)$.

95. The article of claim 81 wherein the predetermined pattern comprises:

B	R	B	R
G	IR	G	IR
B	R	B	R
G	IR	G	IR

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

96. The article of claim 95, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m,n-1)+X(m,n+1)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

97. The article of claim 95, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1)+X(m,n+1)}{2}$.

98. The article of claim 95, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n)

is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m+1,n+1) + X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n) + X(m+1,n)}{2}$.

99. The article of claim 95, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n) + X(m+1,n)}{2}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n+1) + X(m,n-1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by

$$B = \frac{X(m-1,n-1) + X(m+1,n+1) + X(m-1,n+1) + X(m+1,n-1)}{4}.$$

100. The article of claim 81 wherein the predetermined pattern comprises:

B	G	B	B
IR	R	IR	R
B	G	B	G

IR	R	IR	R

where R indicates red intensity information, G indicates green intensity information, B indicates blue intensity information and IR indicates infrared intensity information.

101. The article of claim 100, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n)+X(m+1,n)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n-1)+X(m-1,n+1)+X(m+1,n+1)+X(m+1,n-1)}{4}$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m,n-1)+X(m,n+1)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = X(m,n)$.

102. The article of claim 100, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an odd integer and n is an even integer, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m-1,n-1)+X(m+1,n-1)+X(m-1,n+1)+X(m+1,n+1)}{4}$, the red intensity corresponding to the location (m,n) is given by $R = \frac{X(m-1,n)+X(m+1,n)}{2}$, the green

intensity corresponding to the location (m,n) is given by $G = X(m,n)$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m,n-1) + X(m,n+1)}{2}$.

103. The article of claim 100, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m is an even integer and n is an odd integer, the infrared intensity corresponding to the location (m,n) is given by $IR = X(m,n)$, the red intensity corresponding to the location (m,n) is given by $R = X(m-1,n)$, the green intensity corresponding to the location (m,n) is given by $G = \frac{X(m-1,n-1) + X(m+1,n-1) + X(m-1,n+1) + X(m+1,n+1)}{4}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n) + X(m+1,n)}{2}$.

104. The article of claim 100, wherein for a pixel in the predetermined pixel pattern in a location (m,n) where m indicates a row and n indicates a column and X(m,n) is the intensity corresponding to the pixel in the location (m,n), if m and n are both odd integers, the infrared intensity corresponding to the location (m,n) is given by $IR = \frac{X(m,n-1) + X(m,n+1)}{2}$, the red intensity corresponding to the location (m,n) is given by $R = X(m,n)$, the green intensity corresponding to the location (m,n) is given by

$G = \frac{X(m-1,n)+X(m+1,n)}{2}$, and the blue intensity corresponding to the location (m,n) is given by $B = \frac{X(m-1,n-1)+X(m+1,n+1)+X(m+1,n-1)+X(m-1,n+1)}{4}$.